BioNanoScience 2017 vol.7 N1, pages 73-74

Semaphorins Are Likely to Be Involved in the Control of Hibernation

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Abstract

© 2016, Springer Science+Business Media New York.Hibernation is unique mammals' phenotype demonstrated surviving in seasonal adverse environment conditions. During hibernation, all of systems of organs undergo alterations in their metabolic activity and physiology similar to different physiological conditions associated with human diseases and injuries, which represent a proper model for studying new approaches in clinical treatment. In this study, we have analyzed expression of semaphorins in small hibernator edible dormouse (Glis glis). Semaphorins are factors which involved in a key process of axon guidance and cell–cell communication and can act as tumor suppressor. We found that gene coding Semaphorin-3D (SEMA3D), previously reported to be specific for brain and heart of mammals, represents one of the most upregulated transcripts in the muscles of the hibernating dormice. Furthermore, another member of the same family, Semaphorin-5B (SEMA5B), was strongly induced in the spinal cord of hibernating animals. These observations make semaphorin group, recently attracting more attention due to anti-tumor activity, one of the target for in-depth analysis in relation to the molecular mechanisms of hibernation.

http://dx.doi.org/10.1007/s12668-016-0292-z

Keywords

Edible dormice, Gene expression, Hibernation, Semaphorin

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